

FIGURE 1

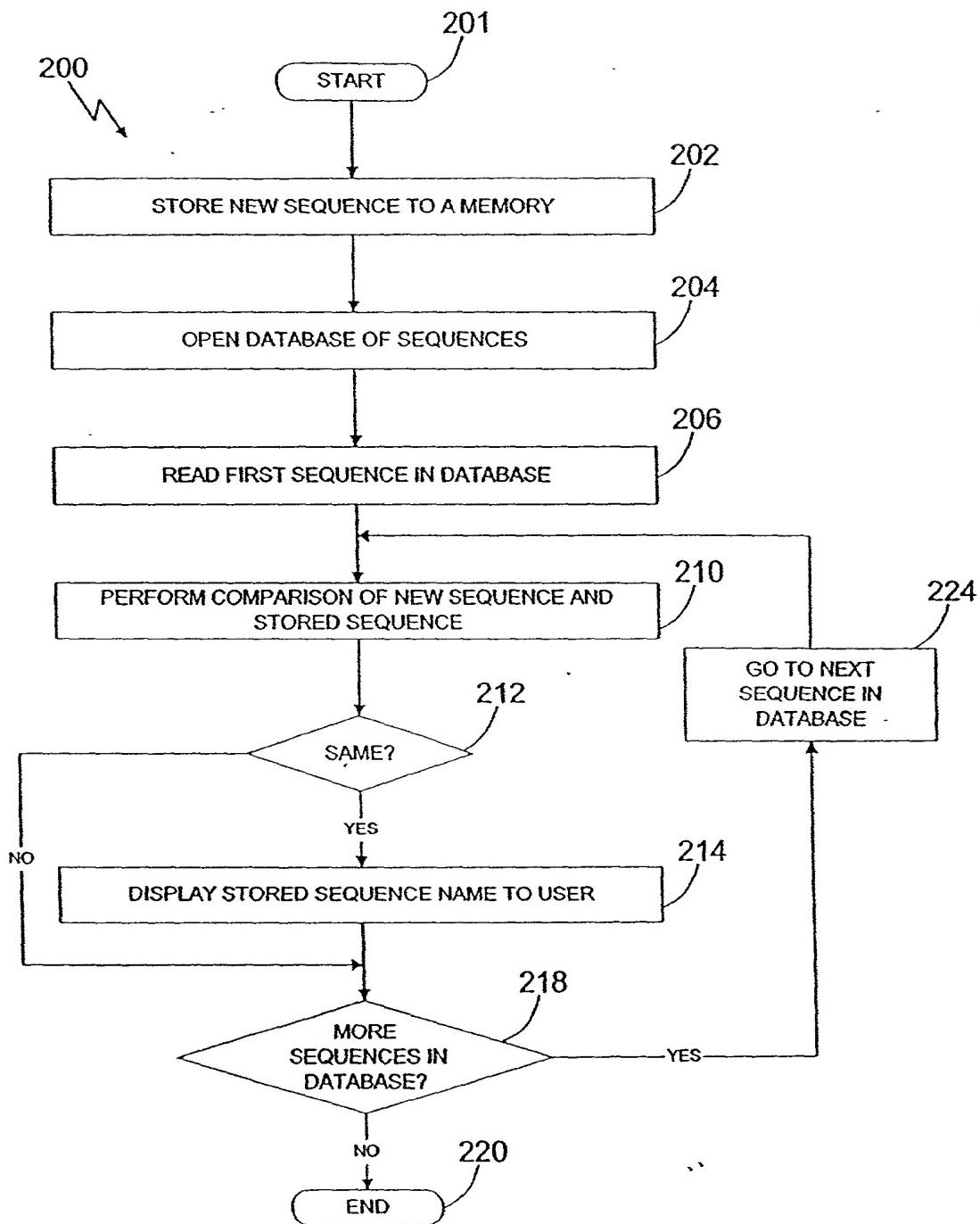


FIGURE 2

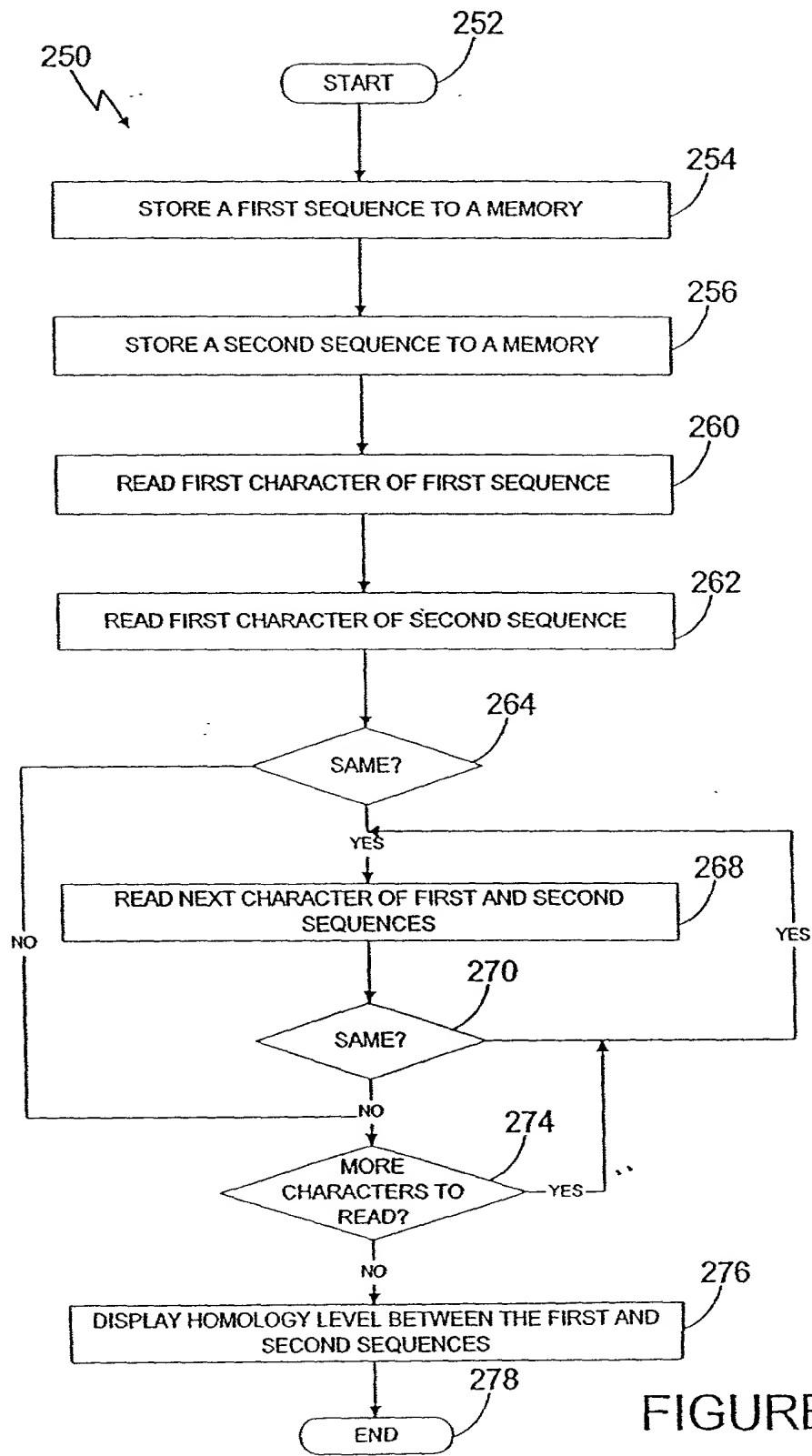


FIGURE 3

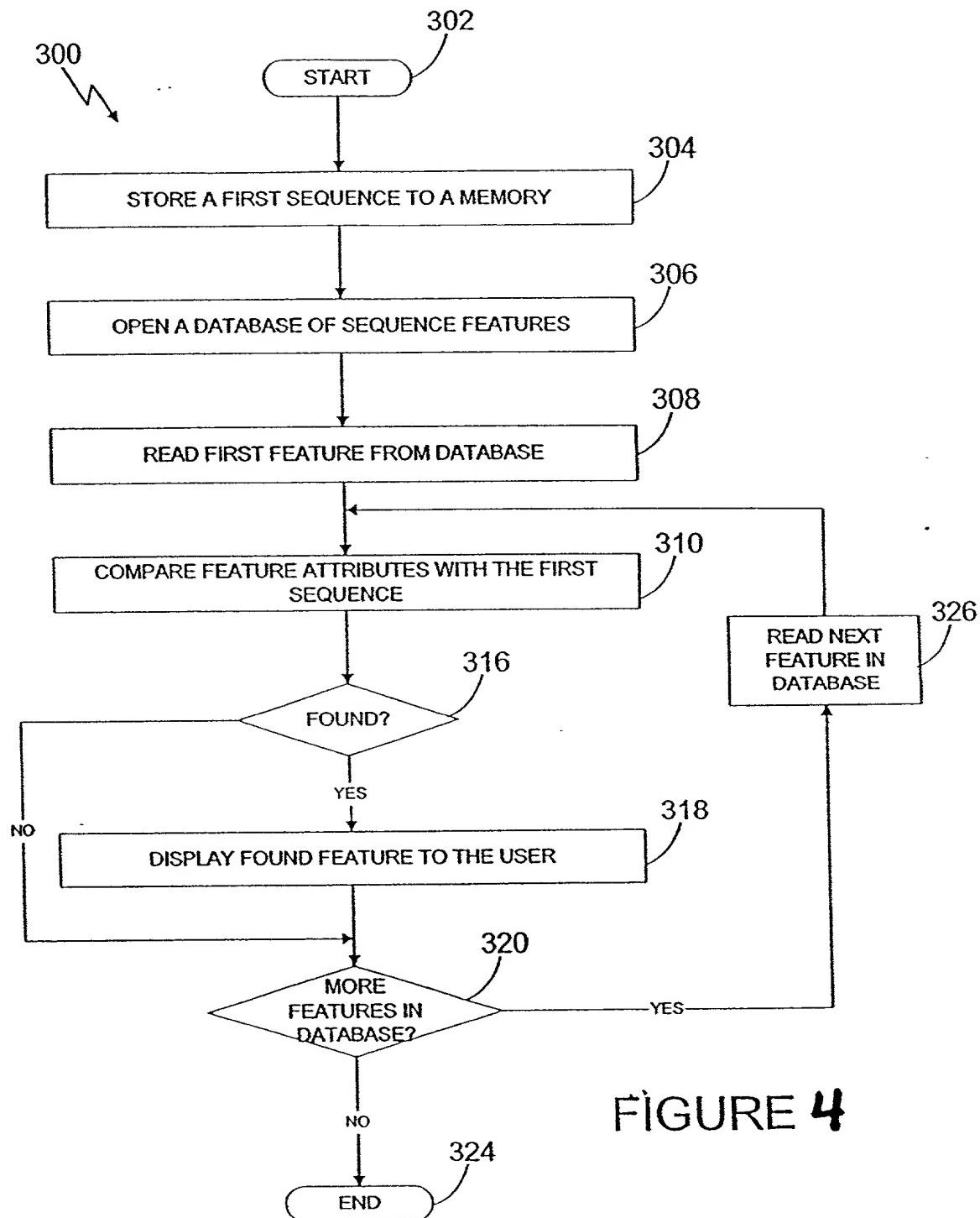


FIGURE 4

FIG. 5
Staphylococcus Marinus - F1-12LC

1.	ATG TCT TTA AAC AAG CAC TCT TGG ATG GAT ATG ATA ATT CTC AGC TTT TCT TCT TTC Met Ser Leu Asn Lys His Ser Trp Met Asp Met Ile Ile Phe Ile Ser Phe Ser Phe	60
6.	61 CCA ATA ACA ATG ATC GCA TTA GCT ATC TCT ATG TCG TCA TGG TTT AAT ATA TGG AAT AAT Pro Leu Thr Met Ile Met Ile Ala Leu Ala Ile Ser Met Ser Ser Ile Phe Asn Ile Trp Asn Asn	120
12.	121 GCA ATA AGC GAT CTA GGA CAT GCT GTT AAA ACC AGT GTT CCT CCA ATA TTC AAT CTA GGT Ala Ile Ser Asp Leu Glu His Ala Val Lys Ser Ser Val Ala Pro Ile Phe Asn Leu Gly	180
18.	181 CCT GCA ATT GGT GGG ATA CTA ATT GTT ATA GTT GGT TTA AGA AAT CTT TAT TCG TGG AGT Leu Ala Ile Glu Ile Val Ile Leu Ile Val Ile	240
24.	241 AGA GTT AAA GGA TCT TTA ATC ATA TCC ATG GGT GAA ATT CTT AAC TTA ATA GGG GTT TTC Arg Val Lys Glu Ser Leu Ile Ile Ile Ser Met Gly Val Phe Leu Asn Leu Ile Gly Val Phe	300
30.	301 GAC GAA GTA ATT GGT TGG ATA CAT TTC CTA GTG TCA GTT TTG TTT TCA ATA ATA ATA Asp Glu Val Tyr Glu Ile Val Ile His Phe Leu Val Ser Val Ile Phe Leu Ser Ile Ile	360
36.	361 GCA TAT TTC ATA GCT ATA TCA ATA CTT GAC AAA TCA ATA CTT GCG ATA GCT GTT CTA ACT ATA ATA Ala Tyr Phe Ile Ala Ile Ser Ile Ile Ser Ile Ile Asp Lys Ser Trp Ile Ala Val Ile Val Ile Ile	420
42.	421 GGT CAT ATT GCA ATG TGG TAT CTA CAC TTT GCT TCA GAG ATT CCG AGA GGT GCG GCT ATT Gly His Ile Ala Met Trp Tyr Leu His Phe Ala Ser Glu Ile Pro Arg Gly Ala Ala Ile	480
48.	481 CCC GAG TTA TTA GCG GAA TTC TCG TTT TTA CCA TIC TAT ATA AGA GAC TAT TTT AAA TCA Pro Glu Leu Leu Ala Val Phe Ser Ile Pro Phe Tyr Ile Arg Asp Tyr Ile Arg Asp Ser	540
54.	541 TAC ACT AAA CGA TAG 181 Tyr Thr Lys Arg End	555
58.		185

FIG. 6A
Pyrodictium - TAG11-17C

1 ATG AAA CTC CTT GAG CCC ACA AAT ACC TCC TAC ACG CTC GAT TTA CAG GAT TTA GCA TTT GAT CAT
1 Met Lys Leu Leu Glu Pro Thr Asn Thr Ser Tyr Thr Leu Leu Glu Asp Leu Ala Leu His 60
61 TTT GCA TTT TAC TGG TTT CTG GCC GTG TAT ACG TGG TTA CCC GGT GTC CTC CTA GTC CGG GGC
21 Phe Ala Phe Tyr Trp Phe Leu Ala Val Tyr Thr Trp Leu Pro Gly Val Leu Val Arg Gly 120
121 GTA GCT GTG GAC ACA GGG GTG CCT CGG GTG CCT GGG CTC GGC CGG CCG GGT AAG AGG CTG
141 Val Ala Val Asp Thr Gly Val Ala Arg Val Pro Gly Leu Glu Arg Arg Gly Lys Arg Leu 180
181 CTC CTC GCT GGT GTG GCT GTC GTC TTC GCG CCT GTT GTC TCC GTC GTC CCG GCT TAT GTG 240
61 Leu Leu Ala Val Ala Val Val Leu Ala Leu Val Val Ser Val Val Ser Val Val Pro Ala Tyr Val 80
241 GCG TAT AGT AGT CTC CAC CCG GAG AGC TGT CGG CCC GTT GCG CCG GAG GGG CTC ACC TAC
81 Ala Tyr Ser Ser Leu His Pro Glu Ser Cys Arg Pro Val Ala Pro Glu Gly Leu Thr Tyr 100
301 AAA GAG TTC AGC GTG ACC GCG GAG GAT GGC TTG GTG GTT CGG GGC TGG GTG CTG GGC CCC
101 Lys Glu Phe Ser Val Thr Ala Glu Asp Gly Leu Val Val Arg Gly Trp Val Leu Gly Pro 360
361 GGC GCT GGG GGC AAC CCG GTG TTC GTC GTC ATG CAC GGG TAT ACT GGG TGC CGC TCG GCG
121 Gly Ala Gly Asn Pro Val Phe Val Leu Met His Gly Tyr Thr Gly Cys Arg Ser Ala 420
421 CCC TAC ATG GCT GTG CTC GCG CCG GAG CTC GTC GAG TGG GGG TAC CCG GTC GTG GTG TTC
141 Pro Tyr Met Ala Val Leu Ala Arg Glu Leu Val Glu Trp Gly Tyr Pro Val Val Val Phe 480
481 GAC TTC CGG GGC CAC GGG GAG AGC GGC TCG ACG ACC ATT GGG CCC CGG GAG GTG CTG
161 Asp Phe Arg Gly His Gly Glu Ser Gly Gly Ser Thr Thr His Pro Arg Glu Val Leu 540
541 GAT GCC CGG GCT GTG GGT GGC TAT GTC TCG GAG CGG TTC CCC CGG CGG ATA ATA TTG 600
181 Asp Ala Arg Ala Val Val Gly Tyr Val Ser Glu Arg 680

FIG. 6B
Pyrodictium - TAG11-17LC

601 GTG GGG TTC AGT ATG GGC GGC GCT GTA GCG ATC GTG GAG GGT GCT GGG GAC CCG CGG GTC 660
601 Val Gly Phe Ser Met Gly Ala Val Ala Thr Val Glu Gly Ala Glu Asp Pro Arg Val 220
661 TAC GCG GTG GCT GCT GAT AGC CCG TAC TAT AGG CTC CGG GAC GTC ATA CCC CGG TGG CTG 720
661 Tyr Ala Val Ala Ala Asp Ser Pro Tyr Tyr Arg Leu Arg Asp Val Ile Pro Arg Thr Leu 240
721 GAG TAC AAG ACG CCG CTG CCG GGC TGG GGT GGT GTC TAC GGG AGG CTG 780
721 Glu Tyr Lys Thr Pro Leu Pro Gly Thr Val Gly Val Leu Ala Gly Phe Tyr Gly Arg Leu 260
781 ATG GCG GGC GTT GAC CTC GGC TTC GGC CCC GCT GGG GTG GAG CGC GTG GAT AAG CCG TTG 840
781 Met Ala Gly Val Asp Leu Gly Pro Ala Gly Val Glu Arg Val Asp Lys Pro Leu 280
841 CTG GTG TAT GGG CCC CCG GAC CCG CTC GTG ACC CGG GAC GAG CGC AGG AGC CTG GCG 900
841 Leu Val Val Tyr Gly Pro Arg Asp Pro Leu Val Thr Arg Asp Glu Ala Arg Ser Leu Ala 300
901 TCC CGT AGC CCG TGT GGC CGT CTC GTC GAG GTT CCT GGG GCT GGC CAC GTG GAG GCC GTG 960
901 Ser Arg Ser Pro Cys Gly Arg Leu Val Glu Val Pro Gly His Val Glu Ala Val 320
961 GAT GTG CTC GGG CCG GGC CGC TAC GCA GAC GAC ATG CTG ATA GAG CTG GCG CAC GAG GAG TGC 1020
961 Asp Val Leu Gly Pro Gly Arg Tyr Ala Asp Met Leu Ile Glu His Glu Cys 340
1021 CCT CCG GGG GCC GGT GGC TGA 1041
1021 Pro Pro Gly Ala Gly Gly End 347

FIG. 7A

Archaeoglobus venificus SN P6-24LC

1 ATG CCA TAT GTT AGG AAT GGT GGT GTA AAT ATC TAT TAT GAA CCT GAG GGA CCT GAG
1 Met Pro Tyr Val Arg Asn Gly Val Asn Thr Tyr Glu Leu Val Asp Gly Pro Glu 20
61 CCA CCA ATT GTC TTT GTT CAC GGA TGG ACA GCA AAT ATG AAT TTT TGG AAA GAG CAA AGA 120
21 Pro Pro Pro Ile Val Phe Val His Gly Trp Thr Ala Asn Met Asn Phe Trp Lys Glu Glu Val Asp Gly 140
121 CGT TAT TTT GCA GGC AGG AAT ATG ATG TTG TTT GTC GAT AAC AGA GGT CAG GGC AGG TCC
141 Arg Tyr Phe Ala Gly Arg Asn Met Met Leu Phe Val Asp Asn Arg Gly His Gly Arg Ser 60
181 GAT AAG CCA CTT GGA TAC GAT TTC TAC AGA TTT GAG AAC TTC ATT TCA GAT TTA GAT GCG 240
61 Asp Lys Pro Leu Gly Tyr Asp Phe Tyr Arg Phe Glu Asn Phe Thr Ser Asp Leu Asp Ala 80
241 GTT GTT AGG GAG ACT GGA GTG GAG AAA TTT GTT CTC GTC GGA CAT TCA TTC GGA ACA ATG
81 Val Val Arg Glu Thr Gly Val Gly Phe Val Lys Phe Val Lys Phe Val Lys His Ser Phe Gly Thr Met 100
301 ATC TCT ATG AAG TAC TGT TCG GAG TAT CGG AAT CGG GTT CTT GCT CTA ATC CTC ATA GGT 360
101 Thr Ser Met Lys Tyr Cys Ser Glu Tyr Arg Asn Arg Val Leu Ala Leu Ile Leu Ile Gly 120
361 GGT GGG AGC AGA ATA AAG CCT CTA CAC AGA ATT GGA TAT CCT TTA GCA AAG ATT CCT GCA 420
121 Gly Ser Arg Ile Lys Leu Leu His Arg Thr Gly Tyr Pro Leu Ala Lys Ile Leu Ala 140
421 TCC ATT GCA TAC AAG TCT TCA AGA TTG GTC GCA GAT CCT TCC TTT GGC AAA AAT GCT 480
141 Ser Thr Ala Tyr Lys Lys Ser Ser Arg Leu Val Ala Asp Leu Ser Phe Gly Ilys Asn Ala 160
481 GGT GAA CCT AAA GAG TGG GGA TGG Trp Lys Glu Trp Lys Glu Trp Lys Glu Trp Lys Glu 160
161 Gly Glu Leu Lys Lys Glu Trp Lys Glu 180
540 GCA ATG GCA ATG GAT TAT ACA CCC TCC TAC GTG GCA 540
181 Met Tyr Thr Tyr Arg Thr Leu Thr Lys Val Asn Leu Glu Asn Thr Lys Val Asn Leu Glu Lys Ile Asp 200
601 TGT CCA ACA CTC ATT ATC GTT GCA GAA GAG GAT GCA CTA ATT CCC GTT AGC AAA TCA GTT 660
201 Cys Pro Thr Leu Ile Ile Val Gly Glu Glu Asp Ala Leu Pro Val Ser Lys Ser Val 220

...GAGCTGACGAGGATA GAA AAC TCA AAG CTT GTG ATC CTC AAC TCG GGG CAT TGC

**FIG. 7B
Archaeoglobus Venificus SN P6-24LC**

661 GAGCTGACGAGGATA GAA AAC TCA AAG CTT GTG ATC CTC AAC TCG GGG CAT TGC 720
661 Glu Ile Ser Arg Arg Ile Glu Asn Ser Lys Leu Val Thr Ile Pro Asn Ser Gly His Cys 240
721 GTAATGCTTGAGAGTCCAAGTCAAATAGCATTGACGAAATGGAATTCATTTCTTCA GCA 780
721 Val Met Leu Glu Ser Pro Ser Glu Val Asn Arg Ala Met Asp Glu Phe Ile Ser Ser Ala 260
781 CAG TTC TAA
261 Gln Phe End
789
263

FIG. 8
***Aquifax pyrophilus* - 28LC**

1	TTCAGA TTGAGGAAA TTT GAA GAG ATA AAC CTC GTT CTT TCG CGA GCT GCA AAG GGC	60
2	Leu Arg Leu Arg Lys Phe Glu Glu Ile Asn Leu Val Val Ser Gly Gly Ala Ala Lys GLY	20
61	ATA GCC CAC ATA GGT GTT TTG AAA GCT ATA AAC GAG CTC GGT ATA AGG GTG AGG GCT TTA	120
21	Ile Ala His Ile His Ile Asn Val Leu Lys Ala Ile Asn Glu Leu Gly Ile Arg Val Arg Ala Leu	140
121	AGC CGG GTG AGC GCC GGG GCA ATC GTT TCG GTQ TTT TAT GCC TCA GGC TAC TCC CCT GAA	180
141	Ser GLy Val Ser Ala GLy Ala Ile Val Ser Val Val Phe Tyr Ala Ser GLy Tyr Ser Pro GLu	60
181	GGG ATG TTC AGC CTT CTG AAG AGG GTA AAC TGG CTC AAG CTG TTT AAG TTC AAG COA CCT	240
61	GLy Met Phe Ser Leu Lys Arg Val Asn Thr Leu Lys Leu Phe Lys Phe Lys Pro Pro	80
241	CTG AAG GGA TTG ATA GGG TGG GAG AAG GCT ATA AGA ATC CTT GAG GAA GTT CTC CCT TAC	300
81	Leu Lys GLy Leu Ile GLy Ile GLy Trp Glu Lys Ala Ile Arg Phe Leu Glu Glu Val Leu Pro Tyr	100
301	AGG AGA ATA GAA AAA CTT GAG ATA CCG ACT ATA TGC CGC ACC GAT TTA TAC TCG TGA	360
101	Arg Arg Ile Glu Lys Leu Glu Ile Pro Thr Tyr Ile Cys Ala Thr Asp Leu Tyr Ser GLy	120
361	AGG GCT CTA TAC CTC TCG GAA GGG AGT TTA ATC CCC GCA CTT CTC GGC AGC TGT GCA ATT	420
121	Arg Ala Leu Tyr Leu Ser Glu GLy Ser Leu Ile Pro Ala Leu Leu GLy Ser Cys Ala Ile	140
421	CCC CGC ATA TTT GAA CCC GTT GAG TAT AAG AAT TAC TTT GCT GTT GAC GGA GGT ATA GTT	480
141	Pro GLy Ile Phe Glu Pro Val GLy TYR Lys Asn Tyr Leu Val Leu Val Asp GLy GLY Ile Val	160
481	AAC AAC CTT CCC GTT GAG CCC TTT CAG GAA AGC GGT ATT CCC ACC GTT TGC GTT GAT GTG	540
161	Asn Asn Leu Pro Val Glu Pro Phe Glu Ser GLy Ile Pro Thr Val Cys Val Asp Val	180
541	CTT CCC ATA GAG CCG GAA AAG GAT ATA AAG AAC ATT CTT CAC ATC CTT TTG AGG AGC TTC	600
181	Leu Pro Ile Glu Pro Glu Lys Asp Ile Lys Asn Ile Leu His Ile Leu Arg Ser Phe	200
601	TTT CTT CGG GTC CGC TCA AAC TCC GAA AAG AGA AAG GAG TTT TGT GAC CTC GTT ATA GTT	660
201	Phe Ile Ala Val Arg Ser Asn Ser Glu Lys Arg Lys Asp Leu Val Ile Val His Ile Leu Arg Ser Phe	220
661	CCT CAG CTT GAG GAG TTC ACA CCC CTT GAT GTT AGA AAA GCG GAC CAA ATA ATG GAG AGG	720
221	Pro Glu Ile Glu Glu Phe Thr Pro Leu Asp Val Arg Lys Ala Asp Gln Ile Met Glu Arg	240
721	GGA TAC ATA AAG GCC TTA GAG GTA CTT TCT GAA TAG	756
241	GLy Ile Ile Lys Ala Leu Glu Val Leu Ser GLu End	

**FIG. 9A
M11TL29L.**

1 ATG TTT AAT ATC CAA T GTT AAT ATA TCT TGG CTC TGT TAT TTT TCA GGG ATA GTT ATG
1 Met Phe Asn Ile Asn Val Phe Val Asn Thr Ser Thr Leu Tyr Phe Ser Gly Ile Val Met 60
61 AAG ACT GTG GAA GAG TAT GCG CTA CTT GAA ACA GGC GTA AGA GTG TTT TAT CGG TGT GTA
61 Lys Thr Val Glu Glu Glu Tyr Ala Leu Leu Glu Thr Gly Val Arg Val Phe Tyr Arg Cys Val 120
121 ATC CCG GAG AAA GCT TTT AAC ACT TTG ATA ATA GGT TCA CAC GGA TGT GGG GCG CAC AGT
121 Thr Pro Glu Lys Ala Phe Asn Thr Leu Ile Ile Gly Ser His Gly Leu Gly Ala His Ser 180
181 GGA ATC TAC ATT AGT GTT GCT GAA GAA TTT GCT AGG CAC GGA TTT GGA TTC TGC ATG CAC
181 Gly Ile Tyr Ile Ser Val Ala Glu Glu Phe Ala Arg His Gly Phe Cys Met His 240
241 GAT CAA AGG GGA CAT GGG AGA ACG GCA AGC GAT AGA GAA AGA GGG TAT GTG GAG GGC TTT
241 Asp Gln Arg Gly His Gly Arg Thr Ala Ser Asp Arg Glu Arg Gly Tyr Val Glu Gly Phe 300
301 CAC AAC TTC ATA GAG GAT ATG AAG GCG TTT CTC GAT TAT GCC AAG TGG CGC GTG GGA GGT
301 His Asn Phe Ile Glu Asp Met Lys Ala Phe Ser Asp Tyr Ala Lys Thr Val Gly Ile Val Gly 360
361 GAC GAA ATA ATA TTG CTA CGA CAC AGT ATG GGC GGG CTG ATA GCG CTC TTA ACA GTT GCA
361 Asp Glu Ile Ile Leu Gly His Ser Met Gly Ile Ile Ala Leu Leu Thr Val Ala 140
421 ACT TAT AAA GAA ATC GCC AAG GGA GTT ATC GCG CTA GCC CCC CCG CTC CAA ATC CCC TTA
421 Thr Tyr Lys Glu Ile Ala Lys Gly Val Ile Ala Pro Ala Leu Gln Ile Pro Leu 160
481 ACC CCG GCT AGA AGA CTT GTT CTA AGC CTC GCG TCA AGG CTT GCC CCG CAT TCT AAG ATC
481 Thr Leu Gln Arg Arg Leu Val Leu Ser Leu Ala Ser Arg Leu Ala Pro His Ser Lys Ile 180
541 ACC TTA CAA AGG AGA TTG CCG CAG AAA CCA GAG GGT TTT CAA AGA GCA AAA GAT ATA GAA
541 Thr Ile Gln Arg Arg Leu Pro Gly Lys Pro Gly Lys Pro Gly Ile Lys Asp Ile Glu 600
601 TAC ACT CTG AGT GAA ATA TCA GTG AAG CTC GTG GAC GAA ATG ATT AAA GCA TCA TCT ATG
601 Tyr Ser Leu Ser Glu Ile Ser Val Lys Ile Val Asp Glu Met Ile Lys Ala Ser Ser Met 660
661 TTG TGG ACC ATA GCA GGG GAA ATT AAT ACT CCC GTC CTG CTT ATT CAT GGG GAA AAA GAC
661 Phe Thr Ile Ala Gly Glu Ile Asn Thr Pro Val Leu Ile Ala Ser Ser Met 720
721 Phe Thr Ile Ala Gly Glu Ile Asn Thr Pro Val Leu Ile Ala Ser Ser Met 780

**FIG. 7B
M11TL-29L.**

721 AAT GTC ATA CCT CCG GAG GCG AGC AAA AAA GCA TAC CAA TTA ATA CCT TCA TTC CCT AAA 780
241 Asn Val Ile Pro Pro Glu Ala Ser Lys Lys Tyr Gln Leu Ile Pro Ser Phe Pro Lys
781 GAG TTG AAA ATA TAC CCC GAT CTT GGA CAC AAC TTG TTT TTT GAA CCA GGC GCG GTG AAA 840
261 Glu Leu Lys Ile Tyr Pro Asp Leu Gly His Asn Leu Phe Phe Glu Pro Gly Ala Val Lys 280
841 ATC GTC ACA GAC ATT GTA GAG TTG GTT AAG AAT CTA CCC AGG GAA AAT CCT TAA 894
281 Ile Val Thr Asp Ile Val Glu Trp Val Lys Asn Leu Pro Arg Glu Asn Pro End 298

FIG. 10A

Thermococcus CL-2-30LC

1 ATG GAG GTT TAC AAG GCC AAA TTC CGC GAA GCA AAG CTC CGC TGG GTC CTC GTC GTT CTG GTT CAT
 1 Met Glu Val Tyr Ile Lys Ala Lys Phe Gly Glu Ala Lys Leu Gly Trp Val Val Val Val Leu Val His 60
 61 GGC CTC GGC GAG AAC AGC CGA AGG TAT GGA AGA CTC ATT AAG GAA CTC AAC TAT GCC GGC 120
 21 Gly Leu Gly Glu His Ser Gly Arg Arg Tyr Gly Arg Leu Ile Lys Glu Leu Asn Tyr Ala Gly 40
 121 TTT GGA GTT TAC ACC TTC GAC TGG CCC GGC CAC CGG AAG AGC CCG GGC AAG AGA GGG CAC 180
 141 Phe Gly Val Tyr Thr Phe Asp Trp Pro Gly His Gly Lys Ser Pro Gly Lys Arg Gly His 60
 181 ACG AGC GTC GAG GCG ATG GAA ATC ATC GAC TCG ATA ATC GAG GAG ATC AGG GAG GAA GAG 240
 161 Thr Ser Val Glu Glu Ala Met Glu Ile Asp Ser Ile Ile Glu Glu Ile Arg Glu Ile Arg Glu Lys 80
 241 CCC TTC CTC TTC GGC CAC AGC CTC GGT GGT CTA ACT GTC ATC AGG TAC GCT GAG ACG CGG 300
 81 Pro Phe Leu Phe Gly His Ser Ile Gly Leu Thr Val Ile Arg Tyr Ala Glu Thr Arg 100
 301 CCC GAT AAA ATA CGG GGA TTA ATA GCT TCC TCG CCT GCC CTC GCC AAG AGC CCG GAA ACG 360
 101 Pro Asp Lys Ile Arg Gly Leu Ile Ala Ser Ser Pro Ala Leu Ala Lys Ser Pro Glu Thr 120
 361 CCG GGC TTC ATG GTG GCC CTC GCG AAG TTC CTC CTC GGAA GATC GCC CCG GGA GTT GTT CTC 420
 121 Pro Gly Phe Met Val Ala Leu Ala Lys Phe Leu Gly Lys Ile Ala Pro Gly Val Val Leu 140
 421 TCC AAC CGC ATA AAG CCG GAA CTC CTC TCG AGG AAC AGG GAC GGC GTG AGG AGG TAC GTT 480
 141 Ser Asn Gly Ile Lys Pro Glu Leu Leu Ser Arg Asn Arg Asp Ala Val Arg Arg Tyr Val 160
 481 GAA GAC CCA CTC GTC CAC GAC AGG ATT TCG GCC AAG CTC GCA AGG AGC ATC TTC GTG AAC 540
 161 Glu Asp Pro Leu Val His Asp Arg Ile Ser Ala Lys Leu Gly Arg Ser Ile Phe Val Asn 180
 541 ATG GAG CTC GCC CAC AGG GAG GCG GAC AAG ATA AAA GTC CTC CTC CTC CTC CTC ATG GGC 600
 181 Met Glu Leu Ala His Arg Glu Ala Asp Lys Ile Lys Val Pro Ile Leu Leu Leu Ile Gly 200
 601 ACT GGC GAT GTA ATA ACC CCG CCT GAA GGC TCA CGC AGA CTC TTC GAG GAG CTG GCC GTC 660
 201 Thr Gly Asp Val Ile Thr Pro Pro Glu Gly Ser Arg Arg Leu Phe Glu Glu Leu Ala Val 220
 661 GAG AAC AAA ACC CTG AGG GAG TTC GAG GGG GCG TAC CAC GAG ATA TTT GAA GAC CCC GAG 720
 221 Glu Asn Lys Thr Leu Arg Glu Phe Glu Gly Ala Tyr His Glu Ile Phe Glu Asp Pro Glu 240

FIG. 4B
Thermococcus CL-2-30LC

721 TGG GCC GAG GAG TTC CAC GAA ACA ATT GTT AAG TGG CTG GTT GAA AAA TCG TAC TCT TCG
241 Trp Ala Glu Glu Phe His Glu Thr Ile Val Lys Trp Leu Val Glu Lys Ser Tyr Ser Ser 780
781 GCT CAA TAA 789
261 Ala Gln End 263

F/G. //

Aquifex VF5-34LC

1 TTGATT GGC AAT TTG AAA TTG AAG AGG TTT GAA GAG GTT AAC TTA GTC CTT CTC GGA GGG 60
1 Leu Ile GLy Asn Leu Lys Leu Ilys Arg Phe Glu Glu Val Asn Leu Val Ser GLy GLy 20
21 GCT GCC AAG GGT ATC GCC CAT ATA GGT GTT TTA AAA GCT CTC GAA GAG CTC GGT ATA AAG 120
21 Ala Ala Lys GLy Ile Ala His Ile GLy Val Leu Lys Ala Leu Glu Glu Ile Lys 40
121 GTA AAG AGG CTC AGC GGG GTA AGT GCT ATC GTT TCC GTC TTT TAC GCT TCG TCC GGC 180
141 Val Lys Arg Leu Ser GLy Val Ser Ala GLy Ala Ile Val Ser Val Phe Tyr Ala Ser GLy 60
181 TAC ACT CCC GAC GAG ATG TTA AAA CTC CTG AAA GAG GTA AAC TGG CTC AAA CTT TTT AAG 240
61 Tyr Thr Pro Asp Glu Met Ileu Lys Leu Leu Lys GLu Val Asn Trp Ileu Lys Leu Phe Lys 80
241 TTC AAA ACA CCG AAA ATG GGC TTA ATG GGG TGG GAG AAG GCT GCA GAG TTT TTG GAA AAA 300
81 Phe Lys Thr Pro Lys Met GLy Leu Met GLy Trp Glu Lys Ala Ala GLu Phe Ile Glu Lys 100
301 GAG CTC GGA GTT AAG AGG CTC GAA GAC CTG AAC ATA CCA ACT TAT CTT TGC TCG GCG GAT 360
101 Glu Ile GLy Val Lys Arg Leu Glu Asp Leu Asn Ile Pro Thr Tyr Ile Cys Ser Ala Asp 120
361 CTG TAC ACC CGA AAG GCT CTT TAC TTC GGC AGA GGT GAC TTA ATT CCC GTG CTT CTC GGA 420
121 Leu Tyr Thr GLy Lys Ala Leu Tyr Phe GLy Arg GLy Asp Ile Pro Val Leu Ileu GLy 140
421 ACT TGT TCC ATA CCC GGG ATT TTT GAA CCA GTT GAG TAC GAG AAT TTT CTA CTT GTT GAC 480
141 Ser Cys Ser Ile Pro GLy Ile Phe Glu Pro Val Glu Tyr GLu Asn Phe Leu Val Val Asp 160
481 GGA CGT ATA GTG AAC AAC CTC CCC GTC GAA CCT TTG GAA AAG TTC AAA GAA CCC ATA ATC 540
161 GLY GLY Ile Val Asn Asn Leu Pro Val GLu Pro Leu GLu Ily Phe Lys GLu Pro Ile Ile 180
541 GGG GTA GAT GTG CTT CCC ATA ACT CAA GAA AAG ATT AAA AAT ATA CTC CAC ATC CTT 600
181 GLY Val Asp Val Leu Pro Ile Thr GLn GLu Arg Lys Ile Lys Asn Ile Leu His Ile Leu 200
601 ATA AGG AGC TTC TTT CTG GCG GTT CGT TCC ATT TCG GAA AAG AGA AAG GAG TTC TGC AAC 660
201 Ile Arg Ser Phe Phe Leu Ala Val Arg Ser Asn Ser GLu Lys Arg Lys GLu Phe Cys Asn 220
661 GTA GTT ATA GAA CCT CCC CTT GAA GAG TCT CCT GAC GTC GAC GTC GAC GAG 720
221 Val Val Ile GLu Pro Pro Leu GLu Phe Ser Pro Leu Asn Asn Lys Ala Asp GLu 240
721 ATA TTC TGC GGG GAT ATG AGA GCA CTT TAA 750
241 Ile Phe Cys GLy Asp Met Arg Ala Leu End 250

FIG. 2A

Teredinibacter - 42L

1 ATG CCA GCT AAT GAC TCA CCC ACG ATC GAC TTT AAT CCT CGC GGC ATT CTT CGC AAC GCT
1 Met Pro Ala Asn Asp Ser Pro Thr Ile Asp Phe Asn Pro Arg Gly Ile Leu Arg Asn Ala 60
61 CAC GCA CAG GTT ATT TTA GCG ACT TCC GGCTTG CGC AAA GCG TTT TTG AAA CGC ACG CAC GCT
21 His Ala Gln Val Ile Leu Ala Thr Ser Gly Leu Arg Lys Ala Phe Leu Lys Arg Thr His 120
121 AAG AGC TAC CTC AGC ACT GCC CAA TGG CTG GAG CTC GAT GCC AAC GGA GTT ACC TTG 180
41 Lys Ser Tyr Leu Ser Thr Ala Gln Trp Leu Glu Ala Gly Asn Gly Val Thr Leu 60
181 GCC GGA GAG CTT AAC ACA GCG CCT GCA ACT GCA TCC TCC TCC CAC CCG GGC CAC AAG AAC 240
61 Ala Gly Glu Glu Ile Leu Asn Thr Ala Pro Ala Thr Ala Ser Ser Ser His Pro Ala His Lys Asn 80
241 ACT CTG GTT ATT GTG CTG CAC GGC TCC AGC CAG TCG GGC TAT GCG ACC TCC 300
81 Thr Leu Val Ile Val Leu His Gly Trp Glu Gly Ser Ser Gln Ser Ala Tyr Ala Thr Ser 100
301 GCT GGC AGC ACG CTT TTC GAC ATT GGG TTC GAC ACT TTT CCG CTT ATT TTG GAT CAC 360
101 Ala Gly Ser Thr Leu Phe Asp Asn Gly Phe Asp Thr Phe Arg Leu Asn Phe Arg Asp His 120
361 GGC GAC ACC TAC CAC TTA AAC CCG GGC ATA ATT AAC TCA TCG ATT GAC GAA GTA GTG 420
121 Gly Asp Thr Tyr His Leu Asn Arg Gly Ile Phe Asn Ser Ser Gln Ser Ala Val Val Vai 140
421 GGC GCA GTC AAA GGC ATC CAG CAG CAA ACC GAC TAC GAC AAG ATT TGC CTG ATT GGG TTC 480
141 Gly Ala Val Ilys Ala Ile Gln Gln Gln Thr Asp Tyr Asp Lys Tyr Cys Leu Met Gly Phe 160
481 TCA CTG GGT GGG AAC ATT GCC ATT TTG CGC GTC GCG GAA CAG CAT CTC GCT AAA CCG 540
161 Ser Leu Gly Gly Asn Phe Ala Leu Arg Val Ala Val Arg Glu Gln His Leu Ala Lys Pro 180
541 CTA GCG GGC GTG CTC GGC GTA TGC CCG GTT CTC GAC CCC GCA CAC ACC ATT GGCC CTA 600
181 Leu Ala Gly Val Leu Ala Val Cys Pro Val Leu Asp Pro Ala His Thr Met Met Ala Leu 200
601 AAC CGA GGT GCG TTT TTC TAC GGC CGC TAT ATT GCG CAT AAA TGG AAG CGC TCG TTAAACC 660
201 Asn Arg Gly Ala Phe Phe Tyr Gly Arg Tyr Phe Ala His Lys Trp Lys Arg Ser Leu Thr 220
661 GCA AAA CTT GCA GCT TTC CCA GAC TAC AAA TAC GGC AAA GAT TTA AAA TCG ATA CAC ACG 720
221 Ala Lys Leu Ala Ala Phe Pro Asp Tyr Lys Tyr Gly Lys Asp Leu Lys Ser Ile His Thr 240

FIG. 12B
Teredinibacter - 42L

721 CTT GAG TTA AAC AAC TAT TTC ATT CCC CGC TAC ACC GGC TTC AAC TCA GTCTCC GAA
724 Leu Asp Glu Leu Asn Asn Tyr Phe Ile Pro Arg Tyr Thr Gly Phe Asn Ser Val Ser Glu 780
781 TAC TTG AAA AGT TAC ACG CTC ACC GGG CAG CTC GCG TTT CTC AAC TGC CCC AGT TAC
784 Leu Lys Ser Tyr Thr Leu Thr Gly Gln Lys Leu Ala Phe Leu Asn Cys Pro Ser Tyr 840
841 ATT CTG GCA GCT GGC GAC GAC CCA ATA ATT CCA GCA TCC GAC TTT CAG AAA ATA GCC AAG
844 Ile Leu Ala Ala Gly Asp Asp Pro Ile Ile Pro Ala Ser Asp Phe Gln Lys Ile Ala Lys 300
901 CCT GCG AAT CTG CAC ATA ACA GTA ACG CAA CAA CGT TCT CAT TGC GCA TAC CTG GAA AAC
960 301 Pro Ala Asn Leu His Ile Thr Val His Ile Gln Gly Ser His Cys Ala Tyr Leu Glu Asn 320
961 CTG CAT AAA CCT AGT GCT GCC GAC AAA TAT GCG GTG AAA TTA TTT GGA GCC TGT TGA 1017
321 Leu His Lys Pro Ser Ala Ala Asp Lys Tyr Ala Val Lys Leu Phe Gly Ala Cys End 339

FIG. 13A
Archeoglobus fulgidus VC16 - 16MC1

ATG	CTT	GAT	ATG	CCA	ATC	GAC	CCT	GTT	TAC	TAC	CAG	CTT	GAG	TAT	
Met	Leu	Asp	Met	Pro	Tie	Asp	Pro	Val	Tyr	Tyr	Gln	Leu	Ala	Glu	Tyr
1			5				10				15				
TTC	GAC	AGT	CTG	CCG	AAG	TTC	GAC	CAG	TTC	TCC	GCC	AGA	GAG	TAC	
Phe	Asp	Ser	Leu	Pro	Lys	Phe	Asp	Gln	Phe	Ser	Ser	Ala	Arg	Glu	Tyr
2			20				25				30				
AGG	GAG	GCG	ATA	AAT	CGA	ATA	TAC	GAG	AGA	AAC	CGG	CAG	CTG	AGC	
Arg	Glu	Ala	Tie	Asn	Arg	Tie	Tyr	Glu	Glu	Arg	Asn	Arg	Gln	Leu	Ser
3			35				40				45				
CAG	CAT	GAG	AGG	GTT	GAA	AGA	GTT	GAG	GAC	AGG	ACG	ATT	AAG	GGG	
Gln	His	Glu	Arg	Val	Glu	Arg	Val	Glu	Asp	Arg	Thr	Tie	Lys	Gly	Arg
4			45				50				55				
AAC	GGA	GAC	ATC	AGA	GTC	AGA	GTT	TAC	CAG	CAG	AAG	CCC	GAT	TCC	
Asn	Gly	Asp	Tie	Arg	Val	Arg	Val	Tyr	Gln	Gln	Lys	Pro	Asp	Ser	Pro
5			55				60				65				
GGT	CTG	GTT	TAC	TAT	CAC	GGT	GCA	TTC	GTA	TTC	GTA	TGC	AGC	ATC	
Val	Leu	Val	Tyr	Tyr	His	Gly	Gly	Val	Tie	Tie	Tie	Cys	Ser	Glu	
6			65				70				75				
TCG	CAC	GAC	GCC	TTA	TGC	AGG	AGA	AYY	GCG	AGA	CTT	TCA	AAC	TCT	
Ser	HIS	Asp	Ala	Leu	Cys	Arg	Arg	Tie	Ala	Arg	Leu	Ser	Asn	Ser	Thr
7			75				80				85				
GTA	GTC	TCC	GTG	GAT	TAC	AGG	CTC	GCT	CCT	GAG	AAG	TTT	CCC	CCC	
Val	Val	Ser	Val	Asp	Tyr	Arg	Leu	Ala	Pro	Glu	His	Lys	Phe	Pro	Ala
8			85				90				95				
CCA	GTT	TAT	CAT	TGC	TAC	120	GAT	GCG	ACC	AAG	125	GTT	GCT	GAG	
Ala	Val	Tyr	Asp	Cys	Tyr	Aso	Ala	Thr	Lys	Trp	Val	Ala	Glu	Asn	Ala
9			95				100				130				
GAG	GAG	CTG	AGG	ATT	GAC	CCG	TCA	AAA	ATC	TTC	GTT	GGG	GAC	AGT	
Glu	Glu	Leu	Arg	Tie	Asp	Pro	Ser	Lys	Tie	Phe	Val	Gly	Asp	Ser	
10			105				110				115				
GCG	GGA	CGG	AAT	CTT	GCC	CCG	GCG	CTT	TCA	ATA	ATG	115	GCG	AGA	
Ala	Gly	Gly	Asn	Leu	Ala	Ala	Ala	Ala	Val	Tie	Met	Ala	Arg	Asp	
11			115				120				125				
											130				
											135				
											140				
											145				
											150				
											155				
											160				
											165				
											170				
											175				

Archeoglogus fulgidus VC16 - 16MC1
FIG. 13B

FIG. 14A
Sulfobus Solfatarious P1 8LC1

ATG CCC CTA GAT CCT AGA ATT AAA AAG TTA CTA GAA TCA GCT CTT ACT	Met Pro Leu Asp Pro Arg Ile Lys Lys Leu Leu Glu Ser Ala Leu Thr
ATA CCA ATT GGT AAA GCC CCA GAA GAG GTA AGA AAG ATA TTT AGG	Ile Pro Ile Gly Lys Ala Pro Val Glu Glu Val Arg Val Arg Ile The Arg
CAA TTA GCG TCG GCA GCT CCC AAA GTC GAA GTT GGA AAA GAA GAT	Gin Leu Ala Ser Ala Ala Pro Lys Val Glu Val Glu Lys Val Glu Asp
ATA AAA ATA CCA GGC AGT GAA ACC GTT ATA AAC GCT AGA GTG TAT	Ile Lys Ile Pro Glu Ser Glu Thr Val Ile Asn Ala Arg Val Tyr Phe
CCG AAG AGT AGC GGT CCT TAT GGT GTT CTA GTG TAT CAT GGA GGC	Pro Lys Ser Ser Glu Pro Tyr Gly Val Leu Val Tyr Leu His Glu Glu
GGT TTT GAA ATA GGC GAT GTG GAA TCT TAT GAC CCA TTA TGT AGA GCA	Gly Phe Val Ile Gly Asp Val Glu Ser Tyr Asp Pro Leu Cys Arg Ala
ATT ACA AAT GCG TGC AAT TGC GTT GAA TCA GTG GAC TAT AGG TAA	Ile Thr Asn Ala Cys Asn Asn Val Val Val Ser Val Asp Tyr Arg Leu
GCT CCA GAA TAC AAG TTT CCT GCA GTT ATC GAT TCA TTT GAC TAT	Ala Pro Glu Tyr Lys Phe Pro Ser Ala Val Val Asp Ser Val Asp
ACT AAT TGG GTT TAT AAC AAT TTA GAT AAA TTT GAT GGA AAG ATG GCA	Thr Asn Trp Val Tyr Asn Asn Leu Asp Lys Phe Asp Glu Lys Met Glu
GTT GCG ATT GCG GGA GAT AGT GCA AAT TTG GCA GCG GTT GTA	Val Ala Ile Ala Glu Asp Ser Ala Glu Asn Leu Ala Val Val
	145 150 155 160

FIG. 14B
Swiftlophus Soltariensis P1 8LC1

GCT CTT CTT TCA AAG GGT AAA ATT AAT TTG AAG TAT CAA ATA CTG GTT
 Ala Leu Leu Ser Lys GLY Lys Tyr Asn Ile Leu Lys Tyr 175
 165 TAC CCA GCG GTA AGT TTA GAT AAC GTT TCA AGA TCC ATG ATA GAG TAC
 Tyr Pro Ala Val Ser Leu Asp Asn Val Ser Arg Ser Met Ile Glu Tyr
 170 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300
 TCT GAT GGG TTC CTT ACC AGA GAG CAT ATA GAG TGG TTC GGT Ser Asp Gly Phe Leu Thr Arg Glu His Ile Glu Trp Phe GLY Ser
 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300
 CAA TAC TTA CGA AGC CCT GCA GAT TTG CTA GAC TTT AGG TTC TCT CCA
 Gin Tyr Leu Arg Ser Pro Ala Asp Leu Ile Asp Phe Arg Phe Ser Pro
 ATT CTG GCG CAA GAT TTC AAC GGA TTA CCT CCA GCC TTC ATA ACA
 Ile Leu Ala Gin Asp Phe Asn GLY Ile Pro Pro Ala Leu Ile Thr
 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300
 GCA GAA TAC GAT CCA GAT CAA GGA GAA GCG TAT GCA AAT AAA
 Ala Glu Tyr Asp Pro Leu Arg Asp Gin GLY Glu Ala Tyr Ala Asn Lys
 CTA CAA GCT GGA Val TCA ACT GTG AGA TTT AAC AAC GAT Val Asn Asn Val
 Leu Leu Ala GLY Val Ser Val Thr Ser Val Arg Phe Val Asn Asn Val
 ATA CAC GGA TTC CTC TCA TTC CCG TTG ATG GAG CAA GGA AGA GAT
 Ile His GLY Phe Leu Ser Phe Phe Pro Leu Met Glu Glu GLY Arg Asp
 GCT ATA GGT CTG ATG ATA GGG TCT GTG TTA CGA GTA TTT GAT AAA
 Ala Ile GLY Lru Ile Leu Ser Val Leu Arg Val Phe Tyr Asp Lys
 ATT TAA Ile 305